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1 Introduction

1.1 Methodology of the urine test.

The urine analysis is part of the medical diagnosis methods frequently used by medical doctors in laboratories in order to reveal diseases.
The most cost-effective device used to screen urine is paper or plastic dipstick.
This microchemistry system has been available for many years and allows qualitative and semi-quantitative analysis within one minute by simple but careful observation. The colour change occurring on each segment of the strip is compared to a colour chart to obtain result. However, a careless doctor, nurse or assistant is entirely capable of misreading or misinterpreting the results.
Urine analyser (urine strip reader) equipment is designed specifically to improve the accuracy and security of urine strip evaluation by using light and photometric reader in order to detect the colour changes on the test strips. The analysers also help in the test data handling and report generation by offering data storage and computerised data processing features in medical laboratories.

LabUReader Plus is a urine chemistry analyser. The reader is semi-automatic benchtop instrument designed to read multiparameter reagent strips. The operator needs only to feed the equipment by placing the moisturised strip on the conveyor – the rest, as forwarding, reading, evaluating and throwing away the strips is done automatically by the device. The strip holding the chemical test reagents, is forwarded and positioned under the reader device and after its colour is evaluated it is dropped into the waste-bin by the conveyor belt. The timing (route-length and speed of the conveyor belt) is adequate to the incubation time – about 80 sconds.

LabUReader Plus is a reflectance photometer that analyses the colour and intensity of the light reflected from the reagent surface and reports the results in clinical meaningful units. Refer to section 4.7.2.1. and 4.2.2. No further calculation is needed by the user. When a strip is moved into the porsition under the optical unit it measures the reflectance of each reagent pad. A portion of the light reflected at specific wavelenghts from the test pad depends upon the degree of colour change of the pad and releated to the concentration of the particular ingredient in urine. The intelligent image analyser software first detects, locates the strip and the pads, then, based on these colour light-wave information **LabUReader Plus** reads the reagent areas and the values are calculated automatically. Results are stored then printed out by the built-in printer and sent to host computer via serial connection.

1.2 The test strips

The base of the urine analysis is the good quality dry reagent urine multistrip. These strips have separated pads for each parameter. Pads contain chemistry, which causes colour changes according to the parameter concentration in the urine.

LabUReader is calibrated for **LABSTRIP U11** urine multistrip and guarantees accurate results all the time. The **LABSTRIP U11** urine strip contains reagents for testing

- Blood
- Billirubin
- Urobilinogen
- Ketones
- Glucose
- Ascorbic acid
- Protein
- pH
- Leucocytes
- Specific Gravity
- Nitrite

2 Description of the reader

The equipment is designed specifically for use in clinical laboratories. In its basic installation the cabinet is almost fully closed, its physical appearance including colour meets the requirements raised by medical laboratories. Its throughput is 500 teststrip evaluations/hour.

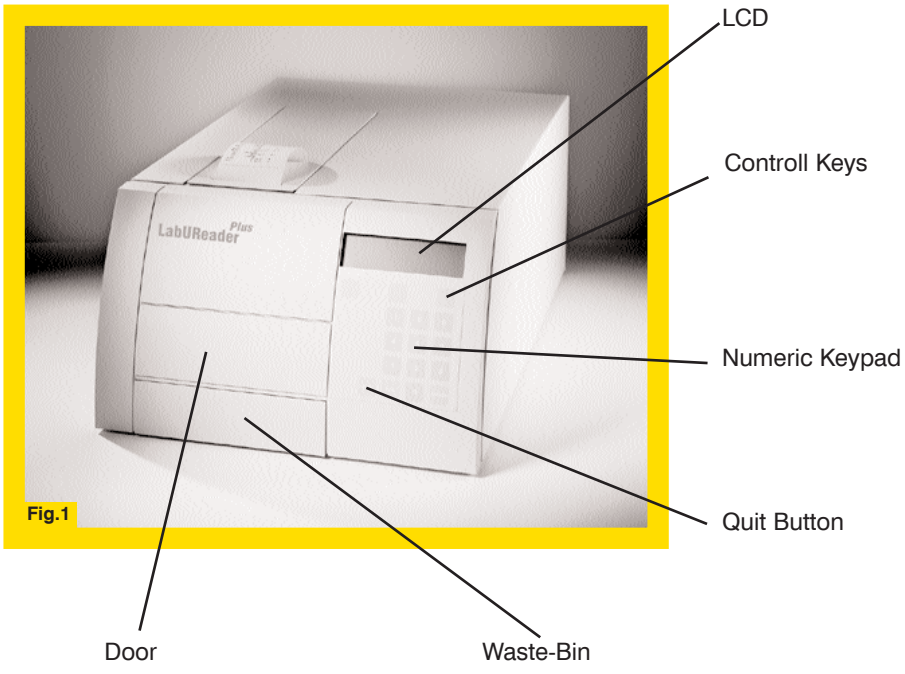


Fig.1

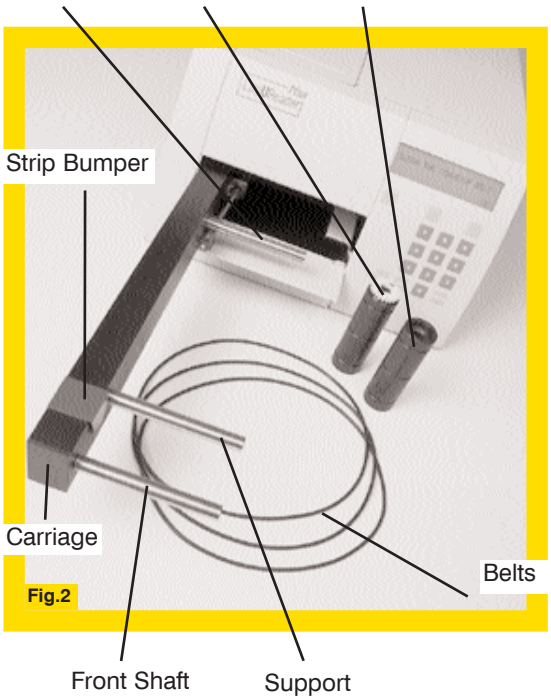


Fig.2

The optical system is designed specially for evaluation of urine strips. The test strip is illuminated by white light and the reflected light from the reagent strip is detected by a colour CCD sensor. The RGB signals are digitalized and this digitalized image is evaluated by the built-in program. Operation is very simple, doesn't require any special knowledge or difficult practice. When measurement starts, the front door opens and the conveyor assembled onto a carriage moves into the measuring position. The strip needs to be placed on the conveyor (see **fig. 7.)**. Both the conveyor and the carriage are driven by DC motor. The carriage has three positions:

- **Closed**. The whole carriage is inside of the cabinet and the door is closed. This is the stand-by or off position.
- **Measurement.** The front of the carriage is ejected of the reader cabinet in order to let the operator place the strip onto the three-belt conveyor.
- **Maintenance.** The carriage is fully ejected. In this position you can remove the belts and cylinders for cleaning them.

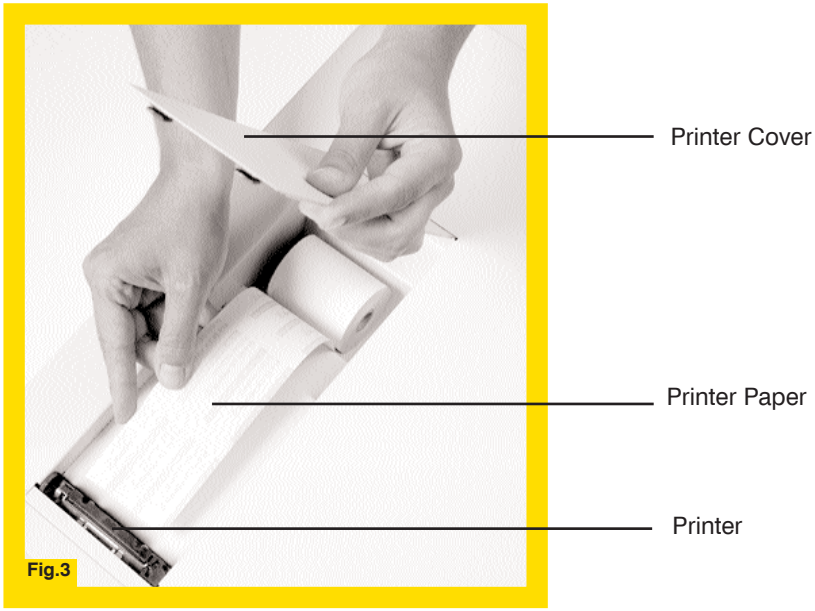


Fig.3

Warning! The carriage movement is controlled by the reader, never try to drive it manually, not even when the reader is in standby or turned off position! If the power shuts down when the carriage is ejected or an error occures, turn the reader off and on, it will find its normal position automatically.

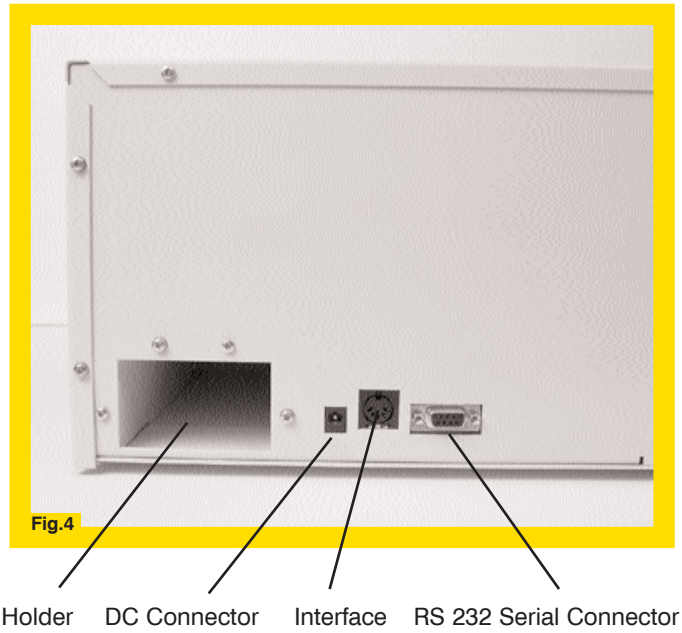


Fig.4

The used strips are collected in a waste-bin located under the conveyor inside the **LabUReader Plus**. It can store a bit more then 150 strips. If the built in strip-counter reaches 150 you will get a warning message of calling for emptying it. To remove the waste-bin just push and release its front panel. It will be automatically ejected. Pull it out totally, empty it and insert it back. Slip it gently till its bumping. You can find the built in printer on the top side. Open the printer cover by lifting its front side. To load the printer paper place the roll into its cave. If the edge of the paper is not straight, cut it. Then just load it into the feeding-slot as shown on **fig 3**. If the reader is switched on, the printer will load it automatically. To remove the paper, just pull out from top side. You can operate the reader by control keys of the built-in numeric keypad and get messages on the four-row LCD.

The interface connectors are located on the back panel. During shipment you can keep the power adapter in the adapter holder, but if the reader is switched on, operate the adapter pulled out position. The external barcode reader and/or keyboard can be connected to the interface connector. The host computer can be connected to the RS232 serial connector.

3 Installation

Fig.5

The **LabUReader** is shipped in a carton box. Prior to unpacking, clear the area where the instrument is to be operated, a table with surface about. 30x50 cm will be needed. Handling the package, please be cautious of the shipping marks on the box. Open the box. Cut the tape only, leaving the carton material intact. It is recommended to keep the packing materials for a while as well, if in case the instrument needs to be moved to another location or must be shipped to have it been repaired in the manufacturers' service.

Check also the packing list, if the shipment is complete. (See **section 8.**). If it is complete follow the next instruction otherwise please contact your distributor immediately.

- Place the **LabUReader Plus** to its working position.
- Using the attached serial cable connect **LabUReader Plus** to your computers' serial port, if necessary.
- Connect your external keyboard or barcode reader to the interface connector.
- Connect the power adapter first to **DC** connector then to the mains.
- Switch the reader on by pressing **ENTER** on the built-in keypad.
- In a few seconds the actual software version appears for a while on the **LCD**.
- **"CLEAR MEMORY"** appears on the display.
- Press **QUIT** button. Now you reached the **MAIN MENU**.
- Select **MENU** by pressing the control key below the **MENU** sign.
- Select **SERVICE** by pressing the marked controll key.
- Select **CLEAN** by pressing the marked controll key. Now the door opens automatically and the conveyor section moves out until the cleaning position is reached.
- Install the cylinder driven onto the shaft 1 until the built in magnet fixes it in the proper position.
- Install the cylinder 2 onto the front shaft until the built in magnet fixes it in the proper position.

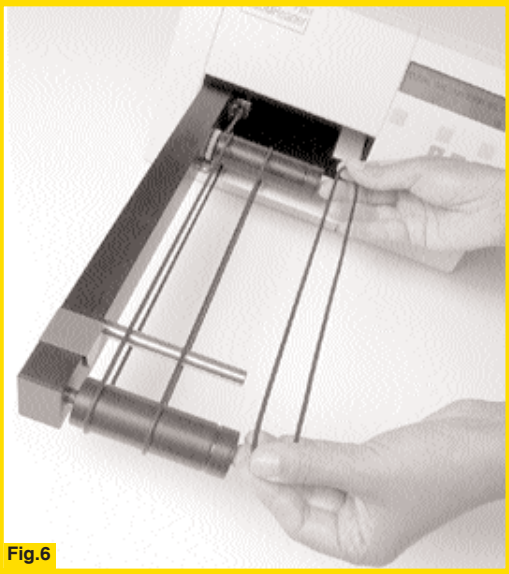


Fig.6

- Install all the three belts onto the cylinders.
- Press **OK** on the control keypad. Now the conveyor slips back and the door closes automatically.
- Open the printer cover.
- Take the roll of printer paper. Insert the roll into its cave and load the free end of paper into the printer by inserting paper into the feeding slot. The paper will be loaded automatically.

Now, the LabUReader Plus is ready to work.

Caution! Use exclusively the AC power adapter Sa 25-073-OU shipped together with the LabUReader Plus, application of other AC power adapters are not allowed under the delivery and guaranty terms of the manufacturer.

4 Operation

The equipment is controlled by a multilevel menu system. The bottom line of the four-row **LCD** indicates the actual selectable menu items – max. 3 at the same time. These menu points could be selected by pressing the control key right below. Their sign when the selected function is executed or without any selection you will get back to the main menu by pressing the **QUIT** button.

4.1 Switching on/off

Connect the low-voltage end of the power-adapter (shipped together with the equipment) to the connector located on the back panel of the equipment, then plug the other end of the adapter cable into the mains voltage. Detecting the power supply is on, the **LabUReader Plus** switches in "**standby**" status. There is still no power consumption, although the adapter already works. Press the **ENTER**/**ON** switch-button. The appearing backlight on the **LCD** indicates that the power is on. Within 3 seconds the type and version number will be also displayed on **LCD,** accompanied by a short beep signal. This information stays displayed for a second then disappears. Now, on of the following alternative options will be executed depending on the stored “working **history**" of the reader.

■ The strip counter is not equal to zero.

IS THE WASTEBIN EMPTY?
YES CANCEL

This means that measurements were done since the last waste bin emptying.
You can empty it now, then press "**YES**", the strip counter will be set to zero, or you can select "**Cancel**" leaving the used strips in the waste bin. In this case the strip counter will not be reset.

■ At the day’s first power-on if there are measurement results stored in the memory, the program will offer an option of deleting the memory content.

CLEAR MEMORY
001
999
OK BACK

CAUTION! If you select "OK" all data stored in memory will be erased! Chose this option only if data have been archived, printed out or you are sure you don't need them any longer!

- At the day's first power-on, if the memory is free and the used-strip counter is set to zero the **MAIN MENU** returns on **LCD**.

2001/12/18		19:19:26
->001		LABUREADER
->000		V.4.00
WORKLIST	START	MENU

If you want to switch the reader off, just press the **QUIT** in the **MAIN MENU**. Answer **YES** when the reader asks for confirmation.

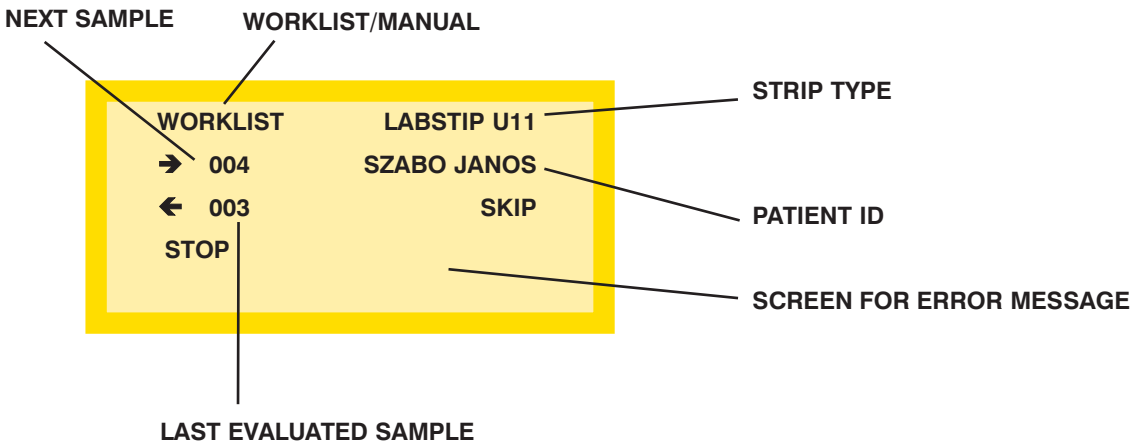
Caution! Before the first measurement a calibration process should be done see section 4.6.2!

4.2 Measurement

The reader can evaluate only the dedicated type of strip what is displayed on the right of the first line when **START** function is selected. There is a calibration card enclosed to each bottle of strip. Each calibration strip has an individual code generated by the strip manufacturer. This code authorises the reader for use of the strip. The code contains the type of the strip as well. Before using a new bottle of strip it is necessary to calibrate the reader. To read more about calibration see **section 4.6.2**.

It is possible to make measurements in sequence of samples or according a prepared worklist. If any worklist or part of it exist and stored in the reader, the "**WORKLIST**" is indicated on the left of the first row of **LCD**. Otherwise the "**MANUAL**" is displayed instead. To learn more about the worklist refer to **section 4.4**.
By selecting **START** the door will open and the conveyor will move in measurement position automatically and the conveyor will run. To stop operation press the **STOP** key. The conveyor will stop running and slips back in "**off**" position and the door gets closed. The **MAIN MENU** will be displayed again.

IMPORTANT! The reader will stop operating only if the conveyor is empty!
The STOP command will be accepted only if the last strip detection and evaluation are over.
If there is no strip detected for 5 minutes a STOP function will be executed.
During operation the following information are displayed on the LCD.



4.2.1 Daily routine

The day-to-day operation of the **LabUReader Plus** is easy, and will be guided on the following lines.

- Have the urine test sample tubes prepared.

good

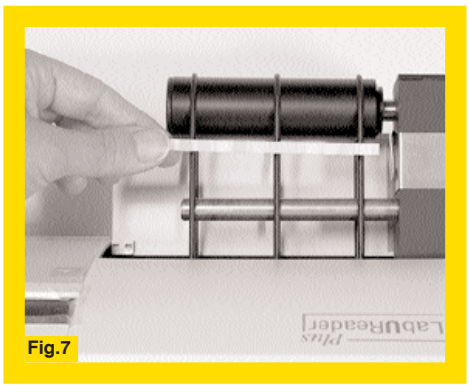


Fig.7

wrong

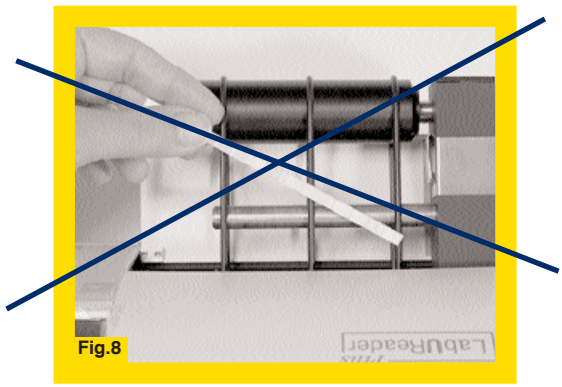


Fig.8

- Press the **Start** button.
- If you are in "**MANUAL**" mode, now you can enter the numerical, max. 13 digit long patient **ID** number to b assigned to the next strip. You can enter the digits via the built-in numerical keypad or using barcode reader or external keyboard. Using the **WORKLIST** mode the next patent's **ID** appears in the second row of the **LCD**. Insert a new unused strip into the next specimen and place on the conveyor with the pads up. Push the strip gently till it bumps against the strip-bumper. The strips must be positioned in right angle however the system can compensate slight deviations. From this phase the test-process is controlled automatically by the **LabUReader Plus** – results are stored, sent to a computer and printed out iif printer is enabled.
- When a strip has been evaluated the results are sent to the serial port, so if a computer is connected to the reader, it can store the data. If the built-in printer is turned on the results are printed out, too.
- If you do not need to wait with the next sample till the previous one is evaluated. Placing a strip on the conveyor, it reaches soon the edge of the cabinet and will be detected. The next sequence number will appear on the second line of the **LCD** indicating the reader is ready for reception of the next strip. This operational regime lets the user work continuously.
- Finishing your daily routine press the **Stop** key**.** The conveyor will stop running.

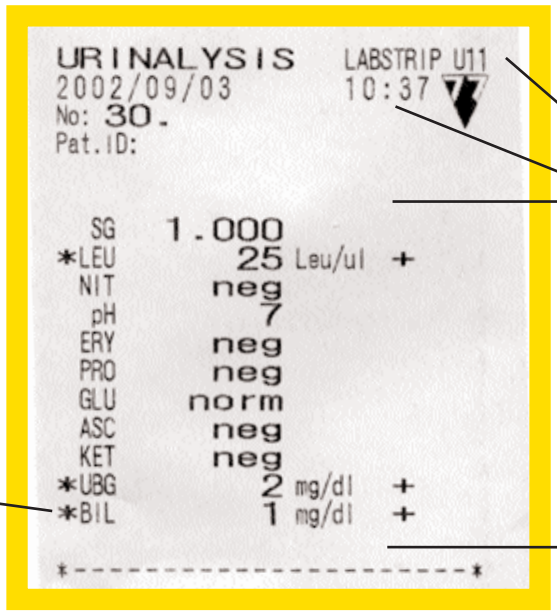
If you would like to skip a measurement from the worklist, just select "**SKIP**" option, the reader will take the next element of the list or in **MANUAL** mode will skip the next sequence number.

If during the work you reach the preprogrammed measurement counts, you will get a warning message printed out. In this case you are still allowed to go on measuring an additional 1% of the named counts. In this case you would rather finish your work, perform a calibration process with a new calibration card. See **section 4.5.2**. Otherwise the reader stops working waiting for a new calibration.

Note. The following error messages may appear during the measurement process.

- "**The waste-bin is full!**" This message is accompanied with a beep that in a few seconds will stops. It means that you overrun the preprogrammed limit specified as of 150 measurement counts without emptying the waste-bin. Interrupt the measurement process and empty the waste-bin then continue working.
- "**The waste-bin is out!**" This message is accompanied by a beep that in a few seconds will stop. It means that the waste-bin is not in right position.
  Maybe you didn't slip it back completly after emptying or you opened it accidentally.

4.2.2 Result printout



	Conc.		1				mg/dl
	SI						
	Arbitr.		+	++	+++		
	Conc.						mg/dl
	SI						umol/l
	Arbitr.		+	++	+++	++++	
	Conc.						mg/dl
	SI		1.5	5	15		mmol/l
	Arbitr.		+	++	+++		
	Conc.						mg/dl
	SI						pH
	Arbitr.		+	++			
	Conc.						mg/dl
	SI			10		50	mmol/l
	Arbitr.		+	++	+++	++++	
	Conc.						mg/dl
	SI			1			pH
	Arbitr.		+	++	+++		
	Conc.						Ery/ul
	SI						Ery/ul
	Arbitr.		+	++	+++		
	Conc./SI		5	6	7	8	9
	Arbitr.		5	6	7	8	9
	Conc.						
	SI						
	Arbitr.		+				
	Conc.						Leu/ul
	SI						Leu/ul
	Arbitr.		+	++	+++		
	Conc./SI		1.000	1.005	1.010	1.015	1.020	1.025	1.030	1.035
	Arbitr.		1.000	1.005	1.010	1.015	1.020	1.025	1.030	1.035

4.3 Recalling results from the memory

It is possible to recall stored results in order to print out or send them to a computer connected to the reader. Select **MENU**/**MEMORY**/**TRANSFER** function by using control keys. Select the desired range and specify whehter to print out or transmit them to b computer. To read more about memory options reffer to **section 4.5.1**.

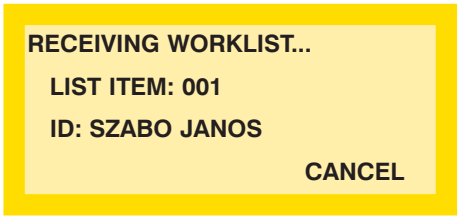
4.4 Worklist

The worklist is a predefined sequence of samples. The worklist contains maximum 128 patient IDs in sequence of planned evaluation. The operator can compile it manually or by the help of a computer. A worklist can bedown loaded from a host computer via serial (RS232) line or generate it manually via the built-in numeric keypad or external device such a bar-code reader or keyboard. The patient **ID** is a maximum 13-character long string containing either numeric or alphabetic characters unless if is entered through the built-in keypad. In this case you can enter only numbers. The stored worklist can be printed out.

4.4.1 Data download

The work list can be downloaded from the **MAIN MENU**. The host computer should start the download process controlled by the protocol set in the **SETUP** menu.

When receiving a worklist a beep sign is heard and the following display is seen.



When the download function is finished successfully the program returns to **MAIN MENU**
To learn more about this option refer to **section 4.7.1.2**.

4.4.2 Edit a worklist

A compiled worklistcan be edited as well. You can edit the **ID**s, add new item or remove single items or the whole worklist. Inserting a new item is not allowed. To use the worklist features follow the flowchart below.

In the **MAIN MENU** select **WORKLIST** option by pressing the lower right button.
Then you can select which function to execute. If there is no existing worklist the **ADD** text is displayed on the **LCD** left side, otherwise **EDIT**. Selecting **EDIT**/**ADD** option you can modify the patient **ID** data and/or enter new items.

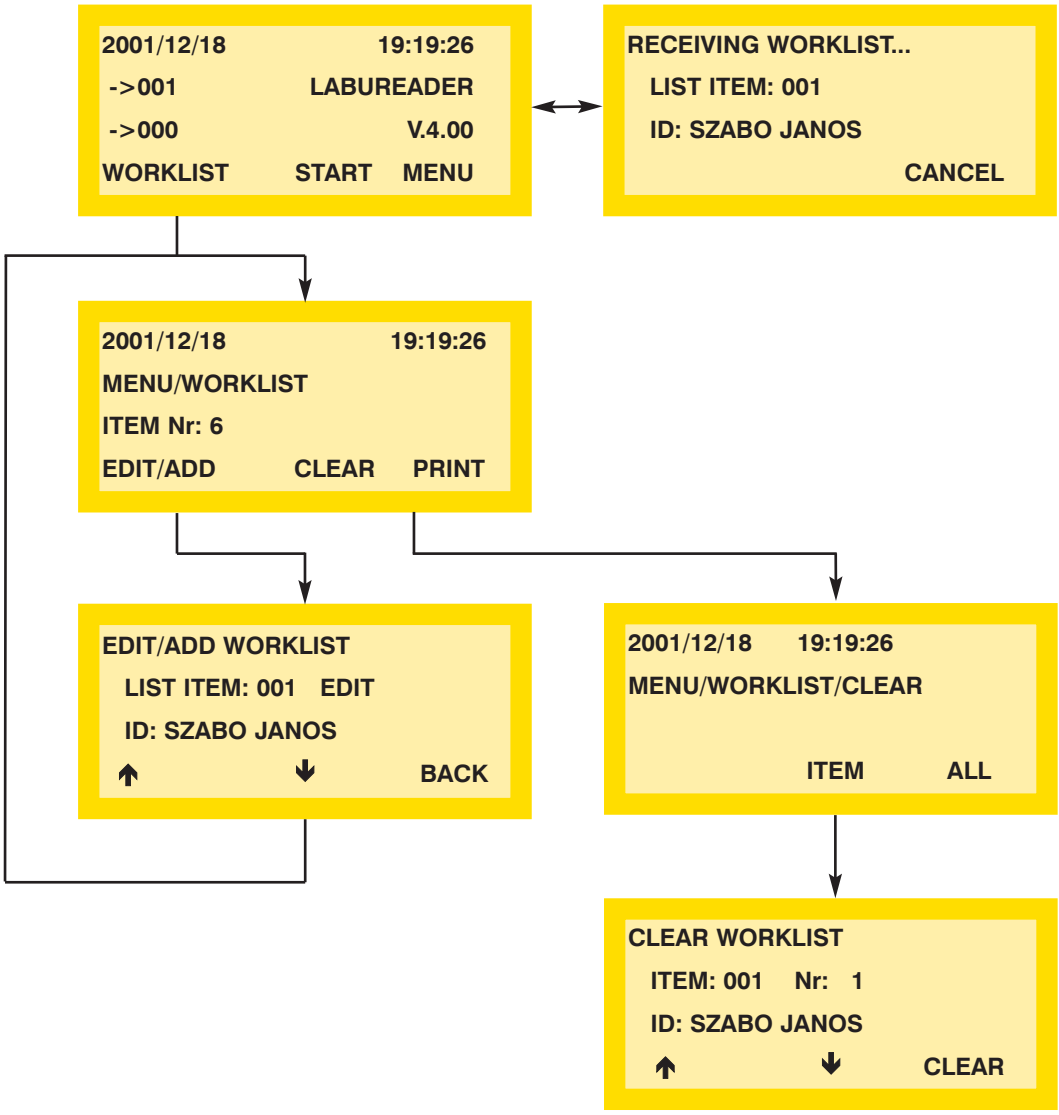
The first element of the worklist appears. By pressing **DEL** button of the built-in numeric keypad you can delete the last character of the **ID**. Using a bar-code reader delete all characters of the wrong **ID** then just shot on the proper bar code. If you use external keyboard use the navigation arrow keys to move the cursor to the character to be modified, press **DEL** and retype the correct character. To confirm the new value press **ENTER**. The next worklist item will appear.

Using the ↑↓ function keys you can scroll over the worklist. Reaching the last item **ADD** will appear on the display. Now you can enter new item.

If the number of worlkilst elements reaches the limit the **FULL** text will be displayed instead of the patient **ID**.

To get back to **MAIN MENU** select **BACK** option.

To remove items from the worklist select **CLEAR** option. In this menu you can delete the whole worklist by selecting **ALL**, or just delete individual items by pressing the button below **ITEM**. Using the ↑↓ keys you can select the desired item. Pressing **OK** the item will be deleted. To go back to **MAIN MENU** press **QUIT** button.

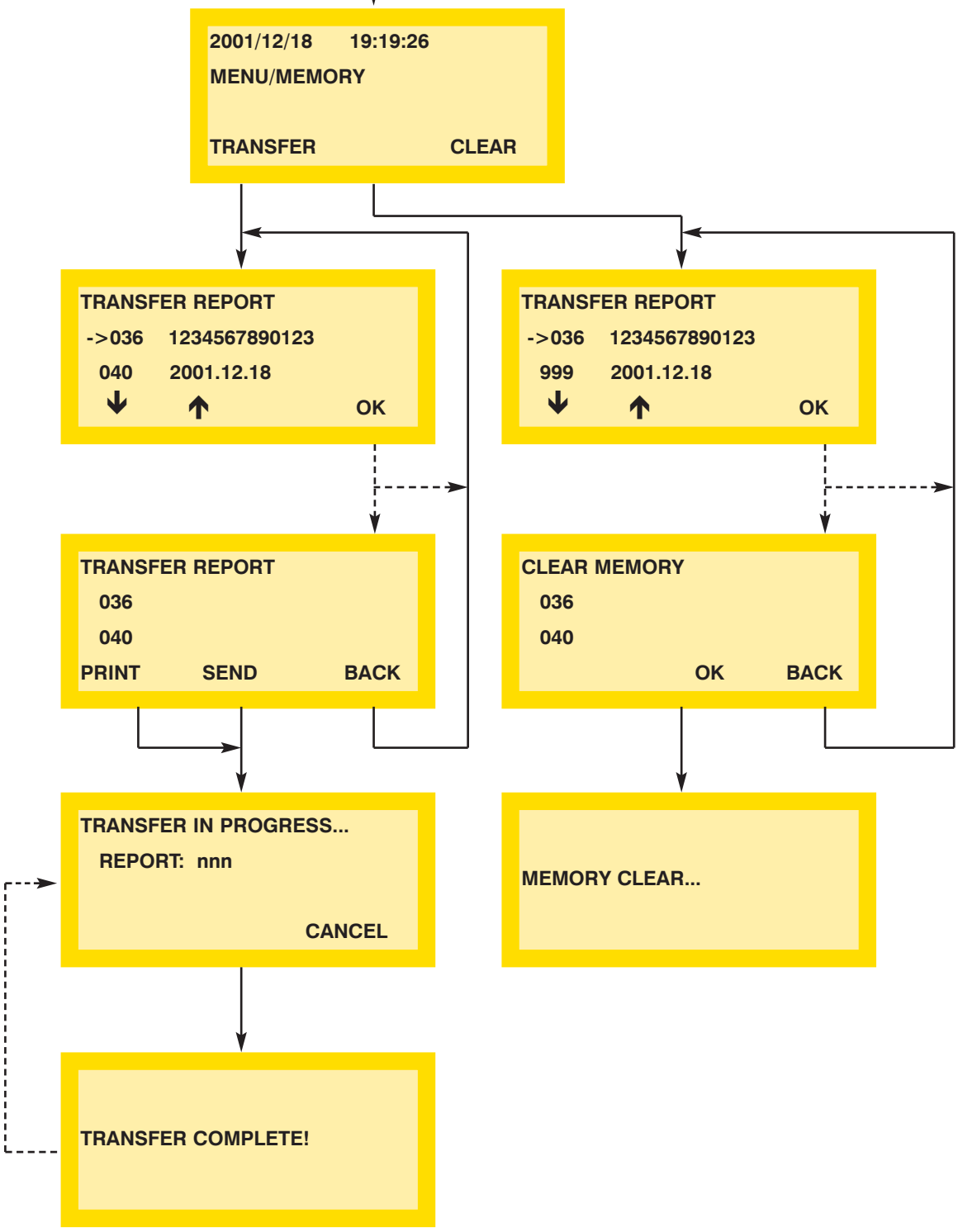


4.5 Menu

The **MENU** option lets you configure the reader, handle and erase the data in memory.
In the **MAIN MENU** select **MENU** option.

4.5.1 Memory

The reader stores the last 1000 results in the memory. With the results the sequence number, entered patient **ID,** time and date of measurement are stored as well. This **MEMORY** function allows you to clear the memory or transfer stored data to the built-in printer or to a device connected to the serial port (i.e. host computer). To operate the memory follow the flowchart below.



4.5.2 Memory data transfer

By this option you can print out or send to a host the stored data. In both cases you can select a range of memory to be transferred. When you get into this menu first you have to select the first element by using ↑↓ keys or entering the desired sequence number. You can use the external keyboard as well. When the first element is selected, press **OK**, now you can chose the last item to be transferred. Pressing again **OK** the next submenu is displayed where you can select to which device you would liketo transfer the selected range of data. By pressing **QUIT** the selection will be cancelled and the **MAIN MENU** appears.

If the first item is 001 and the last is 999 the whole memory will be transferred, but if the first selected item is equal to the last one, only one item will be transferred. The sequence number of the last one selected must be higher than Fthe first one.

When you selected the range to be transferred you can print out by pressing the button under **PRINT** or sent to the host by selecting **SEND**.

After transmission has done press **QUIT** to get back to **MAIN MENU**.

4.5.3 Memory clear

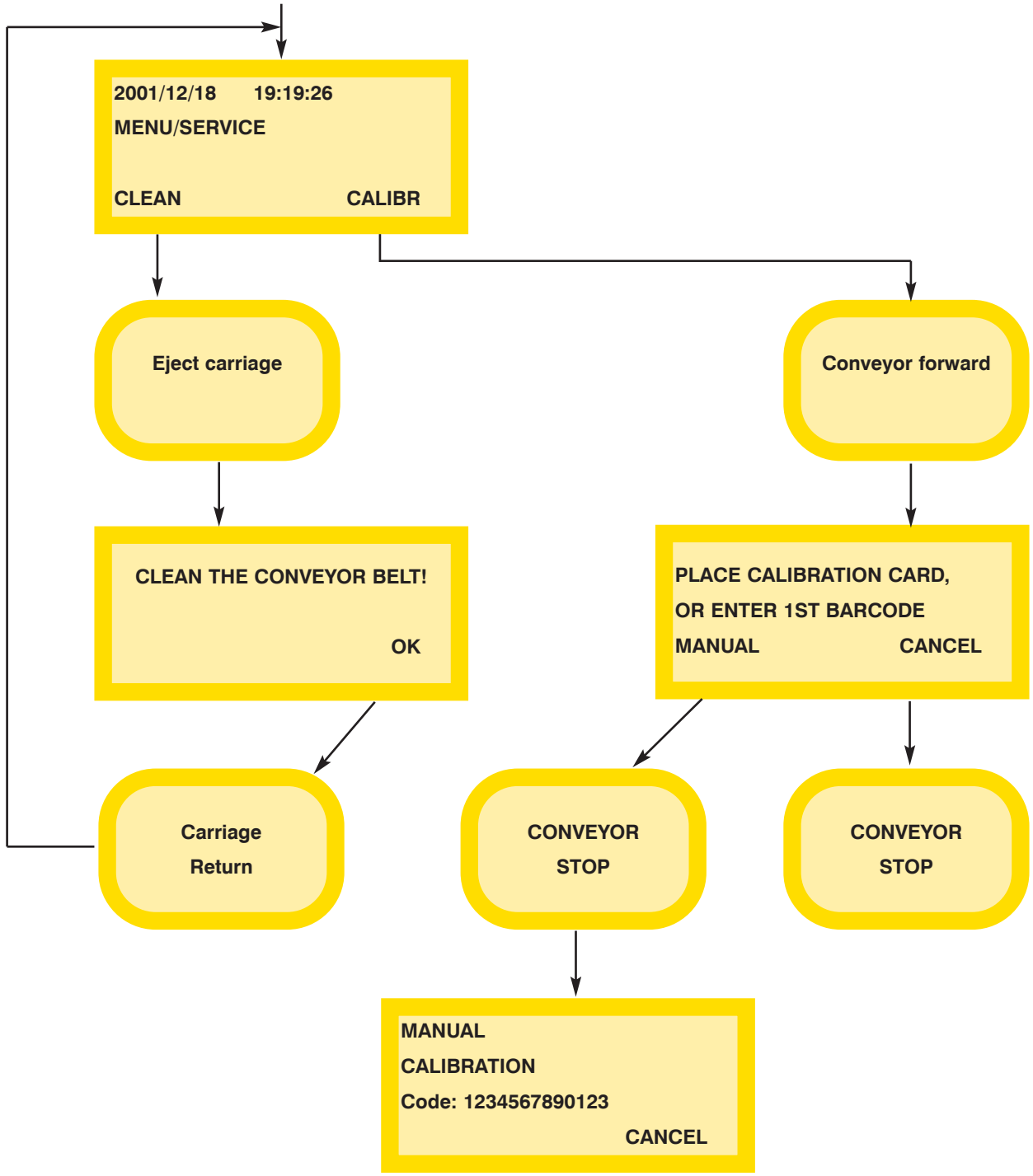
By this option you can delete stored data. First you have to select the desired address range. When you get into this menu first you have to select the first element by using ↑↓ keys or entering the desired sequence number. You can use the external keyboard as well. When the first element is selected, press **OK**, now you can chose the last item to be erased. Pressing again **OK** the next submenu is displayed where you can confirm or go back. By pressing **QUIT** the selection will be cancelled and the **MAIN MENU** appears.

If the first item is 001 and the last is 999 the whole memory will be deleted, but if the first selected item is equal to the last one, only one item will be erased. The sequence number of the last one selected data must be higher than the first one.

When you selected the desired range just press **OK**.

4.6 Service

This submenu allows you to perform a new calibration and to clean the conveyor. Press the button under the **SERVICE** inscription and operate according the flowchart. There is a calibration card enclosed to each bottle of strip. Each calibration strip has an individual code generated by the strip manufacturer. This code allows the reader the use of the strip. The code contains the type of the strip as well. Before using a new bottle of strip it is necessary to newly calibrate the reader. If you purchased **U11** reagent strips in “closed” packaging, you will have one calibration card for 20 bottless of strips.



4.6.1 Cleaning

It is recommended to clean the conveyor regularly. Cleaning the driving cylinders is necessary only weekly or when visible dirt on the cylinders and carriage. The belts have to be cleaned daily or more often in case of high number of measurement.

Selecting **CLEAN** function the carriage ejects automatically. When it stops moving, remove all three belts and if necessary remove the cylinders either. You can wash them either under running water or in alcohol. Dry and replace them. Clean the shafts and support with wet cloth. When you finished, press **OK**. The conveyor will slip back and the **MAIN MENU** appears on the display.

NOTE. **During the carriage movement "Please wait..." is displayed.**

4.6.2 Calibration settings

The calibration card is delivered with the reagent strips. Each calibration card has an individual code printed on it. This code contains different strip related data and the limit number of measurements that controls the reader readiness. If the number of measurement exceeds this limit, the reader will not do any strip evaluation till a new calibration.

If you selected **CALIBRATION** the conveyor will move to measurement position but the conveyor will run faster then in measuring state. Place the calibration card with bar code upside on the conveyor. Before reaching the optical unit the conveyor will slow down and the sensor reads the code. The conveyor starts to move in reserve direction delivered back the calibration card. When the card comes out you can pick it from the conveyor or let it fell down in front of the equipment.

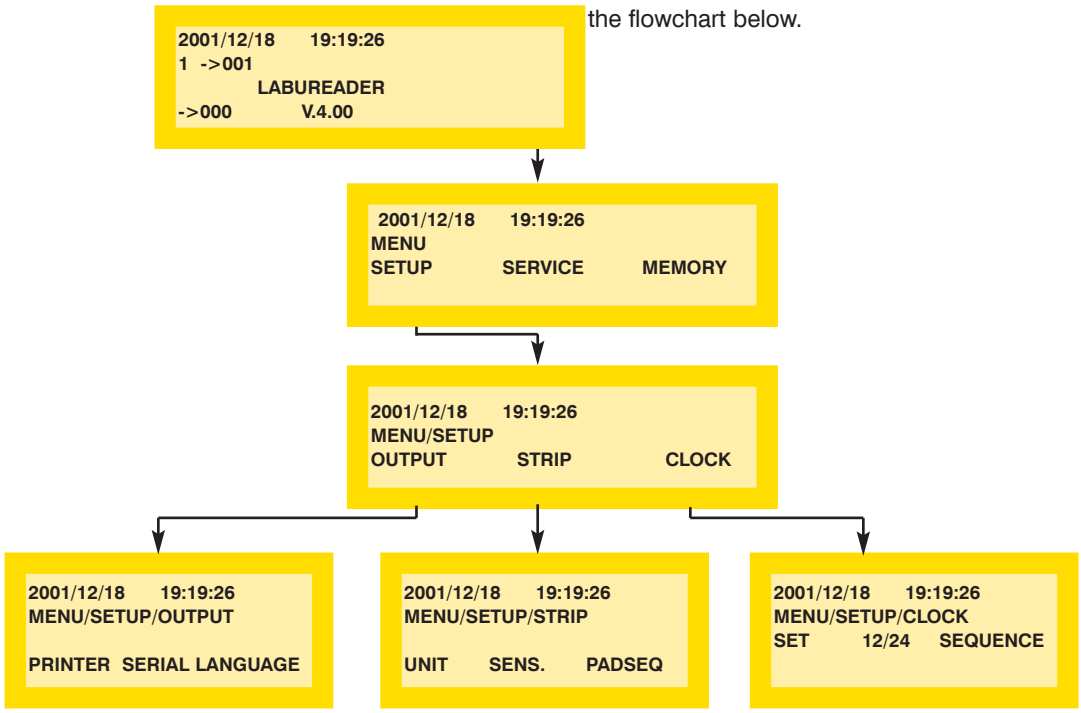
Note. Don't throw away the calibration card till the bottle of strips doesn't run out!

If the calibration wasn't successful or you want to make calibration manually, select **MANUAL**. The conveyor will stop and you can enter the code. For entering you can use the built-in keypad or external devices like bar-code reader or keyboard. When all figures were entered the code evaluation and calibration takes place automatically.

To interrupt calibration select **CANCEL** or press **QUIT** button.

4.7 Setup settings

The **SETUP** menu is adapted to customized the **LabUReader Plus** according to your requirement or working method. Selecting this menu you can configure the communication with your host computer, the built-in printer and the printout format including the result units, the sensitivity of different pads, etc. To get familiar with these features please follow the flowchart below.



4.7.1 Output settings

Through this submenu you can set the printer, the serial port and select the language. Select the desired function by pressing the proper button just under the displayed menu items.

4.7.1.1 Printer settings

In this submenu you can turn the printer on/off and adjust the contrast of the printout. Selecting this option you can check the actual status of the printer.
In order to secure the permanent printout quality there is a built-in option to adjust in a range of 0-3 of the contrast in the print menu by pressing the **CONTRAST** key. This way you can compensate the instable paper quality of different manufacturer. Pressing the **CONTRAST** will change the contrast up by one degree. Reaching the highest contrast (+3) the program will returne to 0.
By pressing the **ON**/**OFF** key the status of the printer will change. Besides the results sent to the serial port, they will be printed out as well, if the printer is **ON**.

4.7.1.2 Serial port settings

Setting up the serial line is needed only if a computer is onnected to the reader. Before changing any of the parameters, refer to the computer service manual and check the used communication protocol. The **LabUReader Plus** supports five predefined communication protocols:

- PC unidirectional – there is no control sum
- LABUREADER – it is optional to send the patient ID or the sequence nr.
- MIDITRON1
- MIDITRON2
- CLINITEC

By pressing several times the proper key you can select the desired option. The following baud rates can be selected: 150, 300, 600, 1200, 2400, 4800, 9600 and 19200.

To get more information about the protocol details please contact your local distributor.

4.7.1.3 Language settings

Basically **LabUReader Plus** supports four languages: Hungarian, English, German and Spanish. On request it is possible to provide further language support as well. Selecting this submenu use the ↑↓ keys to select the desired language then press **OK**.

4.7.2 Strip options

There are three possible options to be set: units, pad sensitivity, pad-sequence in printout.

Caution! Among the operator adjustable parameters, pad sensitivity is **the only, that effects the test results**

4.7.2.1 Measurement Units

LabUReader Plus supports the following measuring units:

- Conventional
- SI
- Arbitrary
- Conventional + Arbitrary
- SI + Arbitrary

4.7.2.2 Sensitivity adjustment

Due to the reader feature providing semi-quantitative result inside the range limits we might get different result on an equipment comparing to an other equipment. To avoid this effect it is possible to adjust the sensitivity of the reader by each pad. To reset the manufacturer adjusted settings for all pads select the **DEFAULT** option. Going back to **MAIN MENU** without changing the actual settings, just press **QUIT**.

Pad measurement sensitivity can be set in two levels in both directions (+/-).
The set values on the display are as follows:

--o
-o
o
o+
o++

If we selected the **SET** function, by pressing the **NEXT** key we can select step by step the proper sensitivity of each test-pad using the **Up** and **Down** arrows. Finishing with the last test-pad sensitivity setting the program automatically returns to the previous function menu. When selected **SET** option the first **PAD** name and the actual setting are displayed. It is not possible to escape till all pad sensitivity is not set. Skipping a pad without any modification just select **NEXT.**

Note. **When the reader is adjusted different from manufacturer setting it will be indicated by asterisks in the footer of the printout!**

4.7.2.3 Pad sequence in printout

By default, the reader prints out the result in the sequence of the **PAD**s physical position but it is possible to customize the lay-out. Obviously this setup option effective only on print out. Once selected the **PADSEQ** option, you can restore either the default sequence or set up your own one by selecting **SET** submenu or by pressing **QUIT key** return to the **MAIN MENU**. Selecting **SET** you can chose pads in desired sequence of the printout lines. In the second row the line no is displayed and the third line indicates the actual parameter name. Using the arrow keys you can perform changes: the **NEXT** function will display the next printout line. When the last line is reached, the program returns to **PADSEQ** submenu.

NOTE. **You can not specify neither empty print out lines nor the same parameter twice or more times.**

4.7.3 Clock settings

The built-in digital clock enables to mark the date and time of the measurement. To get correct information it is necessary to set the clock exactly however it is working even when the reader is turned off or the power supply is not connected. To make your display and printout format according to your requirement the reader supports to change the date and time format.

Selecting the **CLOCK** submenu you can check the actual settings. By pressing the middle button you can change between 12 and 24 our time format. The right key – **SEQUENCE** – allows you to change the date format. Selecting **SET** you can enter the correct date and time. In this case you can use the external keyboard, the control keys or the built-in keypad. By pressing the **QUIT** button the **MAIN MENU** will be activated.

4.8 Operation notes

- The carriage movement is always controlled by the reader, never try to drive it manually not even realizing the rearder is in stand-by mode or switched off.
- Finishing theinstallation or starting your work or opening a new bottle of strips, a calibration process should be done (see **section 4.6.2**).
- Don't discard the calibration card till the same bottle of strip is in use.
- When the reader sensitivity is set differently from manufacturer default, this operational settings will be indicated by asterisks mark in the footer of the printout.

5 Care of the instrument

Operation of the instrument doesn't require any special activity or maitenance, besides cleaning and sterilization no other care is required.

5.1 Printer paper refill

If the printer paper runs out, it is indicated by a dark – red or black – line on the edge of the paper. This indication appears when cca. twelve more results still can be printed out. If a piece of paper remains befor the refill, just pull it out. To load a new roll of paper open the printer cover, place a new roll into its' holder cave. (See **fig. 3**.) If the front edge ot the paper is not cut straight, do it yourself, then feed into the feeding-slot while theprinter detects it and loads it automatically.

5.2 Cleaning

For cleaning you can use any kind of usual cleaning liquid or disinfection solvent. With a wet soft clothe wipe the cover. Then select **MENU**/**SERVICE**/**CLEAN** function. The whole carriage moves out untill cleaning position. Remove belts and clean. Wipe the carriage. Depending on contamination wipe the cylinders or remove and wash them thorougly. Washnig and drying them pay special attention of the borings. You can also use dry compressed air. Install the cylinders and the belts again as shown on **fig. 5 - 6.**

By pressing the control key right below **OK**, the carriage will slip back.

6 Error messages, troubleshooting

During operation different errors and error messages could appear. Below you can find the list of error messages and some suggestions what to do.

E-11....E-17	Hardware error.	Contact your local distributor
E-18	CMOS memory error	
E-19	Hardware error (Firmware ERROR E-19) incompatible firmware version	upgrade with an invalid firmware. Try again with a valid one.
E-21..E-22	Improper test strip position	Make sure, the strip position is corret while placing on the conveyor.
E-24	Improper test strip ID (test strip identifier alters the one entered in the calibration process)	Perform a new calibration
E-25	Missing strip or improper (dried) strip quality	
E-31	Calibration error	Perform a new calibration
E-33	Barcode error (improper barcode entered)	
E-41	Validity calibration error (outdated calibration card)	Perform a new calibration
E-51	Data communication error	Check connection cable or the communication settings
E-60	Carriage mechanical error. Some obstruction on the carriage path, and the carriage can not reach the right position.	Possible error: mechanical driver problem or incorrect control signal reception from the sensor. Disconnect end reconnect the power supply. If the error stands, contact your local distributor.

7 Technical data

methodology	reflectance photometer
wavelengths	460, 550, 650 nm
detection	CCD image processing
max. throughput	500 strip/hour (theoretical)
memory	last 1000 results
display	4 x 24 character LCD
printer	57 mm thermal printer (2 lines/sec)
size	480 x 290 x 165 mm
weight	10 kg
external power-adapter	7,5 V DC / 3A
power consumption	max 20W

Interfaces: RS232 serial port
AT/PC keyboard input

barcode reader input	barcode reader
storage temperature	-25 - +60 °C
operational environment	+15 - +35 °C
relative humidity	0% - 85%

8 Packing list

LabUReader Plus instrument	1 pc
driven cylinder	1 pc
cylinder 2	1 pc
belt	6 pcs
power adapter	1 pc
power cord	1 pc
serial cable	1 pc
users' manual	1 pc
printer paper	1 roll

CE IVD

Notes:

Notes:

LabUReader *Plus*

Photometric Urine Analyzer

rev.1.1

Marking used in this manual

IVD In Vitro Diagnostic Medical Device

Warning!

Manufacturer

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